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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,164	12/16/2005	Weisheng Tian	37137-226289	2016

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PERKINS COIE LLP
POST OFFICE BOX 1208
SEATTLE, WA 98111-1208

EXAMINER	
BASQUILL, SEAN M	
ART UNIT	PAPER NUMBER
1612	

NOTIFICATION DATE	DELIVERY MODE
12/10/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentprocurement@perkinscoie.com
skempe@perkinscoie.com

Office Action Summary	Application No.	Applicant(s)	
	10/561,164	TIAN ET AL.	
	Examiner	Art Unit	
	Sean Basquill	1612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Previous Rejections

1. Applicants' arguments, filed 1 September 2009 have been fully considered. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Claim Rejections - 35 USC § 112 First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 3, and 4 stand and 5-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. *See*, e.g., *In re Wilder*, 22 USPQ 369, 372-3 (Fed. Cir. 1984) (holding that a claim was not adequately described because the specification did 'little more than outline goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate.')

Mere indistinct terms (such as "analogs" of 16-dehydropregnenolone or steroidal sapogenin), however, may not suffice to meet the written description requirement. This is particularly true when a compound is claimed in purely functional terms. *See Univ. of Rochester v. G.D. Searle*, 69 USPQ2d 1886 (CAFC 2004) at 1892, stating:

> The appearance of mere indistinct words in a specification or a claim, even an original claim, does not necessarily satisfy that requirement. A description of an anti-inflammatory steroid, i.e., a steroid (a generic structural term) described even in terms of its functioning of lessening inflammation of tissues fails to distinguish any steroid from others having the same activity or function. A description of what a material does, rather than of what it is, usually does not suffice.... The disclosure must allow one skilled in the art to visualize or recognize the identity of the subject matter purportedly described. (Emphasis added).

Conversely, a description of a chemical genus will usually comprise a recitation of structural features common to the members of the genus, which features constitute a substantial portion of the genus. *Univ. of Calf. V. Eli Lilly*, 43 USPQ 2d 1398, 1406 (Fed. Cir. 1997).

A chemical genus can be adequately described if the disclosure presents a sufficient number of representative species that encompass the genus. MPEP 2163. The MPEP lists factors that can be used to determine if sufficient evidence of possession has been furnished in the disclosure of the Application. These include the level of skill and knowledge in the art, partial structure, physical and/or chemical properties, functional characteristics alone or coupled with a known or disclosed correlation between structure and function, and the method of making the claimed invention. Disclosure of any combination of such identifying characteristics that distinguish the claimed invention from other materials and would lead one of skill in the art to the conclusion that the applicant was in possession of the claimed species is sufficient. MPEP 2163.

Here, the specification does not provide a reasonably representative disclosure of useful steroid sapogenin or 16-dehydropregnenolone analogs generally, a potentially huge genus

inclusive of many different compounds having widely divergent structures and functions. Given the breadth of the term "analogs" as applied in the instant claims, or indicate which structural moieties or modifications would constitute "analogs" within the scope of the instant Claims.

Applicants arguments have been considered and are deemed unpersuasive. The outstanding written description focuses on the inclusion of the term "analog" in the current claims in view of the disclosure as originally filed. The examiner asserted previously, and still asserts, that applicants have failed to adequately describe what they consider sufficiently analogous to a pseudo-steroidal sapogenin to fall within the scope of the invention as claimed. Applicants reference to the three species particularly recited does little to clarify this omission vis-à-vis defining what applicants consider sapogenin analogs, as these three species consist of two epimers at the 5 carbon and one dihydroxy derivative. These three species do not support the broad scope of sapogenin "analogs" as currently claimed, given the wide variance of compounds the skilled artisan would understand the term to encompass.

Claim Rejections - 35 USC § 112 Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 3, and 4 stand and 5-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "analog" is indefinite because it is unclear how far one can deviate from the parent compound without the "analog" being so far removed therefrom as to be a completely different compound. See the related rejection in the "Written Description" section *supra*.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chinese Patent Application Publication 1341603 ("Tian"), in view of U.S. Patent 6,579,862 (hereinafter "Pratap"), and U.S. Patent 4,082,780 (hereinafter "Miki").

As a threshold matter, the examiner indicates that instant Claim 12 recites product-by-process limitations which, in the context of examination, do not impart a patentable distinction between identical chemical compounds derived from other sources. *See* MPEP § 2113 (indicating that if the product in the product-by-process claims is the same as or obvious over those in the prior art, the claim is unpatentable even though the product was made by a different process). As such, instant Claim 12's limitation on the source of the pseudo steroidal sapogenin is of little significance in the construction of the claim.

Tian describes the manufacture of pregnenolone compounds by subjecting the crude steroidal sapogenin (including diosgenin, tigogenin, and hecogenin as well as other natural sapogenins) to a reaction environment of hydrogen peroxide, a metal catalyst and acid. More specifically, Tian suggests the sapogenin, hydrogen peroxide, metal catalyst and acid react for a period of 0.1-24 hours using molar ratios of sapogenin to peroxide to catalyst to acid of 1:1.0-

4.0:0.001-1:0.0005-10, with ratios of 1:1-2:0.01-0.1:0.001-0.01 the recommended ratios. The metal catalysts used include wolframic acid, wolframate, molybdate, phosphomolybdate, molybdic anhydride, heteropolyacid and sodium heteropolyacid; the acid may be acetic, formic, propionic, sulfuric, benzenesulfonic or phosphoric acids, and the solvents include t-butanol, acetone, butanone, and ethyl acetate. Tian indicates that the keto-alcohol obtained is valuable as a precursor for the synthesis of pharmaceutical steroids.

While Tian describes generally the majority of chemical manipulations as claimed in the instant applications for converting steroidal sapogenins to pregnenolone compounds, Tian does not utilize a final basic wash of the reaction compounds with compounds such as sodium hydroxide, sodium carbonate, or potassium bicarbonate to convert the esters so formed into pharmaceutically useful free hydroxy moieties. Tian instead describes a reaction scheme resulting in an acetate, distinguishable from the instantly claimed sapogenins by the presence of an acetate, rather than hydroxy, moiety at the 3-position.

Pratap indicates that pregnadienones, including 16-dehydropregnenolone (Compound 2, Table 2), exhibit potent antihyperlipidemic and antihyperglycemic effects when administered to mammals in need of such treatment. (C.5, L.24-40).

Miki describes the formation of 3-hydroxy steroids through the cleavage of esterified 3-hydroxyl steroids. (C.2, L.3-36). Miki indicates that 3-ester steroids may be converted to 3-hydroxy moieties by basic ester hydrolysis using a base such as sodium or potassium hydroxide, sodium or potassium carbonate, or sodium or potassium bicarbonate in a solvent system at temperatures between about 0ºC to about 80ºC. (C.3, L.36-59)

It would have been *prima facie* obvious to one having ordinary skill in the art at the time of the instant invention to have added the basic acetate hydrolysis step of Miki to the reaction of Tian to provide a method of 16-dehydropregnenolone production claimed in the instant application. One having ordinary skill in the art at the time of the instant invention would have been motivated to do so because of the recognized utility of the free alcohol form of 16-dehydropregnenolone in the treatment of hyperlipidemia and hyperglycemia, as well as the known simplicity of forming an alcohol from an acetate by exposing such to basic conditions.

Applicants arguments have been fully considered and, insofar as they apply to the current rejections of record, are deemed unpersuasive. Applicants argue, in essence, that the results obtained by use of the process claimed as the instant invention unexpectedly provide improved yields over those known in the art. For the benefit of both the examiner and applicants, the examiner has attached a certified translation of the Tian reference applied in the instant and previous actions, rather than the rough machine translation used by the examiner in the previous action. This translation clearly indicates that previous synthetic methods were limited to total yields in the range of 60%. (Translation pg. 3). However, utilizing the procedure relied on by the examiner in formulating the instant obviousness rejections (a synthetic pathway which includes all but the final basic ester hydrolysis step), Tian indicated that yields ranging anywhere from 44.7% (Embodiment 3) to 87.6% were achieved. (Embodiment 10). In addition to rebutting applicants asserted yields as reported in Tian, at the very least Tian demonstrates the yields of such reactions would be expected to vary widely, rendering the results reported by the applicant in the instant application not at all unexpected.

Conclusion

No Claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean Basquill whose telephone number is (571) 270-5862. The examiner can normally be reached on Monday through Thursday, between 8AM and 6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frederick Krass can be reached on (571) 272-0580. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sean Basquill
Art Unit 1612

/JEFFREY S. LUNDGREN/
Primary Examiner, Art Unit 1639